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ABSTRACT

This paper introduces a note of caution about oversubscribing to rational game theory models of analysis at the expense of humanistic inquiry. Although game theory provides a useful tool for the explanation of rational alternatives in given social situations, it should not replace humanistic inquiry. "Good" decision-making in game theory usually focuses on the use of cost-benefit models of rationality to maximize the players best interest, regardless of whether it is morally correct to act in that way. However, the most significant questions are not those concerned with finding the best means to an end, but of reconciling and deciding among the ends or goals themselves. Another problem concerns the assignment of numerical costs to the payoffs. The fact remains that prior numerical measurements cannot be assigned with finality to human behavior. Students may fail to realize that game theory concerns itself with means and not ends, and that real social problems are much more complex and comprehensive. Since game theory models fail to consider the social implications of decision making, an effort must be made to examine social decisions from a humanistic perspective. It is more important for the student to knowthat his decision is a function of his conviction rather than expediency. (Author/DE)

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The Uses of Game Theory in Social Science Education: A Humanistic Perspective

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Within the last decade there has been a trend toward the increased use of game-theoretical models in the social science classroom. These models represent an attempt to demonstrate through mathematical simulation, the most rational behavior to be followed in a decision-making situation. Game theory applications in the social sciences follow the model used by the hypothetical-deductive economic theorists in which rationality is placed within a means-end framework.[1] The decision-maker's behavior is considered to be rational when he moves toward his objectives in an efficient manner. This might be expressed mathematically as follows:

Where: X_1 = net value of alternative$_1$
Y_1 = net cost of alternative$_1$
n = other alternatives

Then: $(X_1 - Y_1) - (X_n - Y_n)$ 0

Thus, the individual is rational when he selects the alternative which is least costly.

The game theoretic approach to rational behavior can be illustrated by a classical example from the literature on the subject, The Prisoner's Dilemma, a non zero-sum, two-person game, shown in the following matrix:

		Prisoner B: Not Confess	Prisoner B: Confess
Prisoner A	Not Confess	5,5	-10,10
	Confess	10,-10	-5,-5

[1] Game theorists generally recognize the seminal work in the field to be: John Von Neumann and Oskar Morgenstern, Theory of Games and Economic Behavior. Princeton: Princeton University Press, 1944.

Briefly, the story goes as follows: Two criminals are captured, placed in separate cells, and both charged with the same serious crime. The evidence is scarce and the District Attorney promises each man that if he confesses, he will be set free and given a reward (10), while his accomplice will get the book thrown at him (-10). If the partner also confesses, then both will receive mild sentences (-5,-5). If neither confesses, then both go free. (5,5)

The rational strategy is to confess, not because it is the right thing to do, but because confessing is in the best interest of each man. Prisoner A reasons that: "If I confess, then no matter what B does, I will come out better than if I don't squeal." So both confess and get mild sentences (-5,-5). The dilemma is that apparent rational strategy does not maximize value. If the prisoners could trust each other (they are not allowed to communicate) they would both profit from not confessing. However, the game is designed so that each prisoner is tempted to double-cross his colleague.

An analogous situation is the arms race in which both sides could benefit by reducing their expenditures for armaments, but that each side could benefit even more by only feigning disarmament while the opposition in fact disarms. The result is that both sides continue to spend vast amounts on arms to play it safe.[2]

Game theoretic models such as Prisoner's Dilemma can serve useful purposes in the instructional situation. One such use is as

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[2]The reader is referred to the expanding literature on game theory for a more comprehensive treatment. Good basic sources include A. Rapoport. Fights, Games, and Debates. Ann Arbor: University of Michigan Press, 1960; R. Luce and H. Raiffa. Games and Decisions. New York: Wiley, 1957; and the Journal of Conflict Resolution which devotes a special section of each issue to gaming theory.

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a heuristic device for the explanation of problematic situations such as the arms race in which students can indeed see the dilemma in concrete terms. Another use would be to present students with a problem and its situational utilities for the purpose of having them discover the most rational or "best" solution. A more open ended approach might be to have the students themselves define a problem in terms of it's situational utilities, define alternatives, decide upon projected consequences, and make the most rational decision, taking all of these factors into consideration.

Game theory can also be useful in studying problematic situations that have already been resolved, as in historical case studies. The advantage here is that existing data about the actual outcome can be evaluated in terms of it's congruence with the prescriptive game theoretic solution.

Other learning outcomes might include the ability to evaluate social scientists' frame of reference in formulating conclusions by attempting to determine the utilities that they have assigned to decision alternatives in the matrix. Game theory can also help the student distinguish between egoistic versus altruistic motives as well as the ability to recognize when a decision-making situation is a zero-sum or a non zero-sum situation.[3]

Proceding from this brief definition and description of some of the heuristic uses of game theory in teaching social science, let us examine the humanistic considerations. It should be noted here

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[3]For a discussion of game theory and it's relationship to egoistic and altruistic values see R. P. Wolff. "Reflections on Game Theory and the Nature of Value," Ethics: 72: April, 1962, 171-9.

that there have been other efforts devoted to the criticism of game theory. Blackett, Waskow, Maccoby and Riesman, as well as a host of others, have discussed the shortcomings of game theory in terms of it's unrealistic assumptions that conflict is limited to two persons, that behavior is always rational, and that interests are always diametrically opposed (zero-sum situations).[4] In this author's view, Wohlstetter has successfully answered these criticisms and no attempt will be made here to resurrect these issues.[5] The arguments that follow focus upon the concern that social science courses, in their attempt to teach "good" decision-making exclusively through the use of cost-benefit models of rationality, stand in real danger of failing to provide students with experience and knowledge about the more important and prior humanistic questions.

Bartos has pointed out that game theory represents a normative and not a descriptive approach to decison-making.[6] It is normative because it tells the actor what action he should take in a given situation. However, game theory tells the decision-maker what he ought to do to maximize his own best interest regardless of whether it is in fact morally correct to act in that way. The prisoner in the dilemma decides to confess not because it is the ethically correct thing to do, but because he sees that it is in his own best interest. The point here

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[4]P. M. S. Blackett. "Critique of Some Contemporary Defence Thinking" Encounter., April, 1961; A. Waskow. "This Game of Startegy," New Republic, February 26, 1962; and M. Maccoby and D. Riesman. "The American Crisis," Commentary, June 1960.

[5]A. Wohlstetter. "Sin and Games in America," in M. Shubik, ed., Game Theory and Other Related Approachs to Human Behavior. New York: J. Wiley and Son, 1964.

[6]O. J. Bartos. Simple Models of Group Behavior. New York: Columbia University Press, 1967, Chapter 15.

's that while game theory is prescriptive rather than descriptive, it prescribes on the basis of what is most prudent rather than what is ethically correct.

The difficulty here of course is that the most significant questions are not those concerned with finding the best means to an end, but of reconciling and deciding among the ends or goals themselves. The most important decisons lie within the realm of the humanistic and our students must not only realize that fact but develop a set of convictions that will guide their behavior. Hopkins has suggested that one way in which the larger moralistic considerations might be taken into account is to have the actor ask himself not only "What is the best decision which will allow me to maximize my own goals?", but also "What if everyone decided to act in this way?"[7] The difficulty is that there is nothing in the game theory model which calls on the actor to invoke the generalizing principle. Schelling has noted that because individuals tend to judge situations according to their own goals, there will always be a need for arbitrary laws to guarantee the social as well as the individual good.[8] The rational game theory model does not provide for the inclusive consideration of value in it's social sense. The efforts to apply game theory to ethics by Braithwaite, Schelling, and Hopkins do so within the context of situational ethics.[9] The fact

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[7]R. F. Hopkins. "Game Theory and Generalization in Ethics," The Review of Politics. 27: October 1965, p. 491-500.

[8]T. C. Schelling. "Some Thoughts on the Relevance of Game Theory to the Analysis of Ethical Systems," J. of Conflict Resolution, 12: March 1968, p. 40.

[9]R. B. Braithwaite. Theory of Games for the Moral Philosopher. Cambridge: Cambridge University Press, 1955; Schelling, op. cit.; and Hopkins, op. cit.

that the actor may consider the humane implications of his decision is coincidental, and not an integral part of the game theory model.

Another problem concerns the assignment of numerical costs to the payoffs. The criteria for rationality, stated earlier, is the minimization of cost. Exactly what is costly to the actor is a problem that continues to plague the game theorist. In fact it is the central problem when attempting to apply game theory to human behavior. While utility theory has developed into a complex science, the fact remains that a prior numerical measurements cannot be assigned with finality. Morgenstern and Von Newmann's hope that the history of the measurement of heat may repeat itself and that the social utilities that look very unnumerical today may turn out to be measurable in the future only serves to indict utility theory rather than resurrect it.[10] Until this problem of social measurement is solved, if indeed it can be, game theory will only be able to offer the most meager help in defining social problems.

One further concern is that students who are continually exposed to rational-game theoretical models will begin to believe that we can have the power over the social situation to the extent that it is possible to accurately quantify and simulate the problems of the firm or the international world. They may fail to realize that game theory concerns itself with means and not ends, that real social problem are much more complex and comprehensive , and that the forced choice game theory model is primitively simplistic and unimaginative

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[10]Von Newman and Morgenstern. op. cit. p. 17.

in comparison to the thinking process undertaken by the human brain in a real situation.

As serious as these deficiencies in the social learning process might be, the most serious gap would be that students would not have considered the relationship between decision-making and conviction. Since game theory and other mathematical behavior models fail to consider the social implications of decision-making, an effort must be made for the extended opportunity to examine social decisions from a humanistic perspective. It is more important that the student know that his decision is a function of his own grounded conviction than to realize that his decision was the most expedient one. Grounded conviction can only come from the extended opportunity for humanistic inquiry into the ethical aspects of the problem under consideration. Game theory can not tell us whether we ought to maximize domestic spending at the expense of the space program or whether it was legitimate to intern Japanese-Americans during the Second World War. Hopefully, those making these kinds of decisions would place a higher priority on the humanistic rather than the expedient considerations in deciding upon what action they would pursue.

In concluding, let it be clear that game theory is not being taken to task for not accomplishing what it does not profess to do in the first place. Game theory has provided us with a heuristically useful tool for the explanation of rational alternatives and consequences in given social situations; furthermore, we can safely

hypothesize that most game theorists would not only recognize the limitations of game theory stated herein but would subscribe to the call for a more balanced approach to decision-making. The purpose of this paper has been to introduce a note of caution about oversubscribing to rational models of analysis at the expense of humanistic inquiry. We have already gone too far in convincing students that "correct answers"are possible where none exist. Let us not allow the trend for multiple choice rationality to supersede the larger humanistic questions in the social science classroom.

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